

Portland Air Toxics 2017 Modeling Study

DEQ recently conducted a study which projects air toxics concentrations for Portland in the year 2017. The study model used the most current and detailed emissions information from businesses and industry, cars and trucks and residential activities.

This information came from both measured and estimated emissions. The model also factored in economic conditions, population growth, topography, weather and new regulations to reduce pollution.

The study is part of DEQ's ongoing effort to understand the sources, concentrations and locations of air toxics in the Portland area. DEQ and the Portland Air Toxics Solutions Committee will use study results to craft an effective air toxics reduction plan.

DEQ expects the plan to include a range of strategies including regulations, local ordinances, incentives and educational programs. DEQ plans to make the draft plan available and seek public comments in summer 2011.

Study results

The study shows there are 15 pollutants that are above health benchmarks. DEQ established air toxics benchmarks as planning goals to protect our health.

The model showed that eight of the 15 pollutants cause the most risk. These pollutants are:

- 1,3 butadiene
- Benzene
- Diesel particulate
- 15 PAH
- Naphthalene
- Cadmium
- Acrolein
- Formaldehyde

Air toxics sources

Important sources of these pollutants include exhaust from cars and trucks, wood burning and industry. Acrolein and formaldehyde form through chemical reactions in the atmosphere.

The largest source of air toxics is gasoline and diesel engines that produce 1,3 butadiene, benzene, ethylbenzene, diesel particulate, arsenic and chromium 6. Another large source of air toxics is residential wood burning that produces 15 PAH (polycyclic aromatic hydrocarbons which are tar-like by-products from auto exhaust and other sources) and naphthalene.

The model shows emissions of metals including manganese, nickel and cadmium are concentrated in or near industrial areas.

Where do highest concentrations of air toxics occur?

The study shows most air toxics are found throughout the study area. Higher concentrations are found in densely populated neighborhoods, near busy roads and highways and in areas with business and industrial activity.



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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

Pollutant	Top source	Impact area
More than 10 times over benchmark		
1,3 butadiene	Cars and trucks	Region wide/Local
Benzene	Cars and trucks	Region wide/Local
Diesel particulate	Cars and trucks	Region wide/Local
15 PAH	Residential wood combustion	Region wide
Naphthalene	Residential wood combustion	Region wide/Local
Cadmium	Industry	Local
Formaldehyde	Secondary formation	Region wide
Acrolein	Secondary formation	Region wide/Local
Between 1 and 10 times over benchmark		
Ethylbenzene	Cars and trucks	Region wide/Local
Arsenic	Cars and trucks	Region wide/Local
Manganese	Industry	Local
Nickel	Industry	Local
Chromium VI	Cars and trucks	Region wide/Local
Dichlorobenzene	Solvents	Region wide/Local
Acetaldehyde	Secondary formation	Region wide

Table shows air toxics over benchmarks in Portland

Why did DEQ do a modeling study instead of a monitoring study?

DEQ has done both. In 2005, DEQ received EPA funding to monitor air toxics at five sites in the Portland region. DEQ currently has funding for only one air toxics monitor in Portland. The monitor is located in North Portland. Modeling is a cost-effective tool for DEQ to estimate air toxics concentrations at over 1000 sites throughout the region.

What are some of the potential emission reduction strategies?

DEQ hired a contractor to help develop potential emission reduction strategies. The Portland Air Toxics Solutions Committee is reviewing these strategies and will recommend additional measures. Strategies being considered will address all the sources of air toxics and may include:

- More stringent/expanded vehicle inspection and maintenance
- Vehicle idling reduction
- Education program about health effects of wood smoke
- Requiring less toxic industrial solvents

[Pollutant summary sheets and maps for air toxics in the Portland region](#)

[Developing Emission Reduction Strategies presentation](#)

[Comparison of modeling studies used to estimate air toxics health risk](#)

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